

Space Biosciences Research Branch – Code SCR

The principal mission of the Branch is to advance space exploration by achieving new scientific discoveries and technological developments in the biosciences. Relevant research and development issues of the branch include radiation detection and biology, fundamental space biology, and the development of countermeasures to preserve human health in space. Teams of researchers are organized around scientific disciplines critical to NASA's biosciences missions.

- **Microgravity and space radiation effects on skeletal health (Globus *et. al.*)**
 - Research to define risks and mechanisms of skeletal tissue degeneration in space and to develop effective countermeasures if needed.
- **Radiation Detection Technologies and Biomarkers (Straume *et. al.*)**
 - Development of small active detectors for Moon, Mars, and beyond.
 - Bay-Area Biomarker Consortium focus on markers of individual susceptibility to radiation and other agents.
- **Effects of Stress Induced by Spaceflight Conditions (Bhattacharya *et. al.*)**
 - Ground-based & flight experiments using *Drosophila* (e.g., FIT on STS-121), Volvox, yeast, and other biomodels to study the effect of spaceflight factors on microbial virulence, immunity, development and behavioral changes.
- **Gravity effects on cellular regeneration (Almeida *et. al.*)**
 - Both ground based and flight studies using stem cell and newt tail regeneration models of how gravity and the space environment affect stem cell health and regenerative potential.
- **Gravity effects on vestibular system (Boyle *et. al.*)**
 - Both ground-based and flight studies using vertebrate and invertebrate experimental systems including collaborative spaceflight experiments with Russians.
- **Drug Stability in Space and Metabolic Countermeasures (Griko *et. al.*)**
 - Development of metabolic approaches to reduce damage to radiation and other risk factors in space.
- **Toxicity of lunar dust (Loftus *et. al.*)**
 - Investigating the health effects of lunar dust - respiratory, dermal and ocular.
- **State-of-the-art high- throughput genomics (Stolc *et. al.*)**
 - High-density oligonucleotide arrays are produced at NASA Ames by NimbleGen system. Bioinformatics are accomplished using NASA Ames supercomputer resources.

